

Remarks/Arguments:

Claims 1-21 are pending in this application and stand rejected. Applicants have amended claims 4 and 19.

Applicant thanks Examiner Tran for speaking with Applicant's attorneys on September 18, 2007 to discuss the rejections. During the discussion, the Applicant's attorneys asserted that neither of the applied references included a soot filter packed with a mass of elongate, flat, narrow strip metal wherein the mass is compressed to provide a first packing density. It was Examiner Tran's position, however, that a conventional metal monolith substrate, as allegedly disclosed in the applied references, would read on this feature, as the monolith substrate cell walls that make up the monolith substrate are a "mass of elongate, flat, narrow strip metal."

The Office objects to claims 4 and 19 based on informalities. Claims 4 and 19 have been amended as suggested in the Office Action to overcome these informalities. Applicants submit that the objection has been overcome.

Claims 1-10 and 13-20 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,665,322 ("Kiyohide"). Claims 1-10 and 13-20 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,248,689 ("Manson"). Claims 11, 12 and 21 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kiyohide in view of design choice. Applicant respectfully submits that the currently pending claims are patentable over the cited Kiyohide and Manson references for at least the reasons set forth below.

Features of Independent Claim 1

Applicant's invention, as recited by amended independent claim 1, includes the following features which are neither disclosed nor suggested by the art of record, namely:

a soot filter packed with a mass of elongate, flat, narrow strip metal wherein said mass is compressed to provide a first packing density.
... (emphasis added).

Applicant's invention as claimed in claim 1 is directed to an exhaust system for a lean-burn internal combustion engine comprising a soot filter. The soot filter is packed with a mass of elongate, flat, narrow strip metal wherein the metal is compressed to provide a first packing density. As discussed in Applicant's specification at page 7, lines 1-3, an exemplary embodiment according to the claimed invention includes cartridge 22 with catalyst bed 24 "packed with knitted 310 stainless steel flattened wire 0.33 mm wide and 0.2 mm thick to 6% volume by volume. . . ." Further, "the next downstream zone of cartridge 22 is occupied by annular feed channel 28 surrounding first filter 30 packed with the same flattened wire as in bed 24, but at 12% volume by volume" (Page 7, lines 5-7).

Response to Rejection of Independent Claim 1 - based on Manson

The Office rejects independent claim 1 as anticipated by Manson. Apparently, the Office's position with respect to Manson is that Manson discloses the feature of a soot filter packed with a mass of elongate, flat, narrow strip metal because Manson discloses metallic supports. As Applicant understands the Office's position, such supports include within the support metallic cell walls that are a "packed mass of elongate, flat, narrow strip metal."

Applicant contends that such an interpretation is unreasonable. As claimed in claim 1, the exhaust system requires a soot filter packed with a mass of elongate, flat, narrow strip metal wherein said mass is compressed to provide a first packing density. Applicant submits that a monolith substrate, even a metal one, does not include such features. As disclosed in Manson, such as shown in Figure 1, support 100 includes longitudinal passageways 106 and adjacent passageways 110. The support can be metallic, as discussed at col. 6, lines 41-47. As further shown in Figure 3, the filter of Manson can have two stages, in which the channels 164 of the second stage are smaller than the channels of the first stage 156. Applicant contends, however, that such channels cannot be considered "a mass of elongate, flat, narrow strip metal wherein said mass is compressed to provide a first packing density." Moreover, there is no teaching or suggestion in Manson that such internal cell walls are compressed to provide a first packing density. Merely including internal elements in the substrate monolith cannot be interpreted to mean that they are a mass compressed to provide a first packing density. Such an interpretation, Applicant contends, reads the term "compressed" out of claim 1.

As disclosed in Applicant's specification, an example of a mass of elongate, flat narrow strip metal is knitted 310 stainless steel flattened wire. The mass of knitted stainless steel wire is compressed to provide a first packing density, for example, having 6% volume by volume. While merely exemplary, the claims must be read in the context of the specification and not in a vacuum. *In re Marosi*, 710 F.2d 799, 802, 218 U.S.P.Q. 289, 292 (Fed. Cir. 1983) (quoting *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976)) ("Claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest reasonable interpretation'.") (emphasis in original).

In comparison, as one of ordinary skill in the art would recognize, the types of filters disclosed in detail in Manson are wall-flow filters, the types of filters distinguished from the metal-based filters of the claimed invention in Applicant's specification. (See e.g., page 1, second paragraph). Further, the soot filter is packed with a mass of elongate, flat, narrow strip metal, not formed of a mass of such material. In other words, the packed mass of the claimed soot filter is not the material of the filter itself, but rather is a mass of material with which the soot filter is packed. This is different than a filter which is formed with channels and for which the channel walls are formed as part of the filter substrate.

Moreover, the mere listing of types of filters, including, for example, metal mesh filters that may be used as diesel particulate filters also fails to provide the necessary disclosure to anticipate each and every feature of Applicant's invention, as claimed in independent claim 1.

Response to Rejection of Independent Claim 1 – based on Kiyohide

The Office rejects independent claim 1 as anticipated by Kiyohide. The Office asserts that Kiyohide discloses an exhaust system as claimed including "a soot filter packed with a mass of elongate, flat, narrow strip metal wherein the mass is compressed to provide a first packing density (**High Density**)(e.g. See col. 3, lines 50-67; col. 4, lines 1-42) . . . " as well as a "catalyst [] supported on a metal substrate of the type used in the filter having a second packing density (**Low Density**) lower than the first packing density" (Office Action, page 3).

Contrary to the Office's assertion, there is no teaching, disclosure or suggestion in Kiyohide of a soot filter packed with a mass of elongate, flat, narrow strip metal wherein said mass is compressed to provide a first packing density. Kiyohide discloses a foam-type filter having "two portions of the filter; a low-density portion and a high-density, thin layer portion." (see col. 5, lines 30-32). Further, the high-density, thin layer portion is formed by a slurry of ceramic foam material molded, dried and sintered, or, is a uniform ceramic material coated with a mixture of ceramic powder that is dried and sintered. (See col. 6, lines 57 to col. 7, line 2). Applicants submit that the only types of filters disclosed in Kiyohide are ceramic filters, none of which include any element that would anticipate "a mass of elongate, flat, narrow strip metal wherein said mass is compressed to provide a first packing density." Even accepting the Office's broad interpretation that a conventional metal filter, such as a wall flow filter, could include a mass of elongate, flat, narrow strip metal (which Applicants contest) by virtue of it having cells bounded by cell walls inside the filter, Kiyohide fails to teach, disclose or suggest such a metal filter anywhere in the reference. Clearly, the ceramic filters do not have internal strip metal components. Moreover, the disclosure of a metal catalyst that is supported on one or both of the two portions of Kiyohide's ceramic filter cannot possibly be considered to read on the mass of elongate, flat, narrow strip metal of Applicant's claim 1.

Notwithstanding this lack of teaching of Kiyohide, Applicant also fails to find where Kiyohide anticipates many of the dependent claims, even with the citations presented by the Office. Two such examples are with respect to claims 10 and 13, in which the Office asserts that Kiyohide discloses that the metal of the filter is Type 300 or Type 400 stainless steel (claim 10) or that the flat, narrow strip metal is a flattened wire (claim 13), in which the Office cites to: claims 3-8; col. 15, lines 1-67; col. 16-17, lines 1-67; col. 18, lines 1-60. Kiyohide clearly does not disclose these features at these citations, nor is there such disclosure anywhere else in the reference.

As such, Applicant contends that Kiyohide fails to anticipate Applicant's claimed invention, even in light of the broad, unreasonable interpretation the Office gives the claims.

Response to Obviousness Rejections

Claims 11, 12 and 21 are rejected as obvious over Kiyohide in view of design choice. For at least the reasons that claim 1 is patentable over Kiyohide, as set forth above, claims 11, 12 and 21, which depend from claim 1, are also patentable over Kiyohide.

Conclusion

Applicant contends that claim 1 is patentable over the prior art of record for the reasons set forth above. Claims 2-21 include all of the features of claim 1 from which they depend. Accordingly, claims 2-21 are also patentable over the art of record for at least the reasons that claim 1 is patentable.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,



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Dated: September 19, 2007

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